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Attitudes about Children and Fertility Limitation Behavior

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Abstract

The relationship between attitudes and individual behavior is at the core of virtually all demographic theories of fertility. This paper extends our understanding of fertility behavior by exploring how psychic costs of childbearing and contraceptive use, conceptualized as attitudes about children and contraception, are related to the transition from high fertility and little contraceptive use to lower fertility and wide spread contraceptive use. Using data from rural Nepal I examine models of the relationship between multiple, setting-specific attitudes about children and contraception and the hazard of contraceptive use to limit childbearing. Specific attitude measures attempt to capture the relative value of children versus consumer goods, the religiously based value of children, and the acceptability of contraceptive use. Findings demonstrate that multiple measures of women's attitudes about children and contraception were all independently related to their fertility limitation behavior.

Demographic theories from a range of disciplines point to attitudes as an important predictor of fertility behavior. In economic models of fertility attitudes are most clearly connected to psychic and social costs and the demand for children (Becker 1991; Bulatao and Lee 1983; Easterlin and Crimmins 1985). Psychological and social-psychological models have been more explicit about the role of attitudes. Several long-standing theories such as the Theory of Planned Behavior (Ajzen 1988; Ajzen and Fishbein 1980; Ajzen and Madden 1986) and the Traits-Desires-Intentions-Behavior framework (Miller and Godwin 1977; Miller and Pasta 1995; Miller, Severy, and Pasta 2004) describe attitudes in relation to an individual's or couple's motivation to have children or control their fertility. Sociological theories of social change also incorporate attitudes by identifying them as a key mechanism through which macro-level changes (i.e. markets, schools) lead to individual level behavioral changes (Lesthaghae and Surkyn 1988; Thornton and Lin 1995). Across these perspectives, attitudes are seen as one crucial component of the motivation for fertility limitation.

This broad theoretical coverage inspired a similarly broad range of empirical research. Much recent work has looked at the relationship between fertility intentions and behaviors and examined the consistency between a person's stated attitudes regarding one very specific aspect of a behavior and their actual behavior, e.g. research on the link between knowledge about contraceptive methods and actual use of those methods (Hayford 2009; Morgan 2001; Oni and McCarthy 1991; Schoen et al. 1999; Wong and Tang 2001). Other research has shown that the attitudes of partners, parents, or community members, particularly as they relate to the morality of contraception, ideal family size, and the importance of having children, all influence an individual's own fertility related behaviors (Bankole and Singh 1998; Kadir et al. 2003; Thomson 1997; Thomson, McDonald, and Bumpass 1990; Williams, Sobieszcyk, and Perez 2000). These studies provide empirical evidence of several of the theorized pathways between attitudes and fertility behavior.

However, there are others—in particular from an individual's attitudes about broader issues like the value of children to their behavior—for which there are fewer empirical examinations. Early empirical research in this area investigated how perceptions of the value of children were related to fertility behaviors (e.g. Fawcett 1983; Hoffman and Hoffman 1973). More recent research expands the common social-psychological frameworks to incorporate attitudes about competing behaviors or looks at latent attitude profiles (Barber 2001; Moors 2008). The current study follows from this work and looks at how the individual's broad attitudes, those that may reveal information on the non-economic value of children or underlying fertility motivation, are related to subsequent fertility behavior.

This paper contributes to the demographic literature by looking at the relationship between women's attitudes about children and contraceptive use and their subsequent fertility limitation behavior. To empirically examine this relationship I focus on a setting in rural Nepal, the Chitwan Valley. I pull together theories and frameworks from multiple disciplines to guide this research and identify setting-specific attitudes that may influence the motivations for fertility limitation. This setting is ideal for both theoretical and empirical reasons. Many of the social demographic theories regarding changes in fertility behaviors that I rely on here were designed to describe settings like Nepal—places that only recently experienced dramatic changes in family related attitudes and behaviors (Caldwell 1982; Bulatao and Lee 1983; Easterlin and Crimmins 1985; Thornton and Lin 1994). Empirically, the specific social and demographic changes and data collection efforts in Chitwan allow me to estimate complex attitude-behavior models of a range of attitudes and with proper temporal ordering for the measures of attitudes and behavior.

THEORETICAL FRAMEWORK

To guide this study I pull together economic theories of fertility (Becker 1991; Bulatao and Lee 1983; Easterlin and Crimmins 1985), social-psychological theories of the attitude-behavior link (Ajzen 1985, 1991; Ajzen and Madden 1986; Fishbein and Ajzen 1975; Miller and Godwin 1977; Miller and Pasta 1995; Miller et al. 2004), and sociological theories of social change (Thornton and Fricke 1987; Caldwell 1982). Economic models frame fertility behavior as a result of a cost-benefit analysis, with empirical research in this area typically incorporating financial costs and benefits associated with both contraception and children. Examples of this work include research on children's economic contributions to the household (Cain 1977, 1983) and on how childcare costs and availability influence the timing of childbearing (DiPrete et al. 2003; Rindfuss et al. 2007). A smaller body of research motivated by this framework provides evidence that social and/or psychic costs, perhaps due to a woman having different fertility intentions from her husband or mother-in-law, are also related to fertility behavior. Couples who disagree about how many children to have, have fewer children and are less likely to use contraception (Biddlecom et al. 1997; Kadir et al. 2003; Thomson 1997)

Less commonly used in demographic research are frameworks rooted in psychology and social-psychology. These models make explicit the connections between attitudes and behavior, typically framing attitudes in connection with motivation to control fertility. Seminal publications by Fawcett in the early 1970s pulled together earlier theoretical and empirical work to point out the range of attitudes that may influence fertility related decisions (Fawcett 1970, 1973). This included attitudes reflecting the emotional satisfaction parents gain from children, cultural motivations for childbearing, and reactions to or opinions of contraceptive methods. The majority of current research relying on these frameworks looks at how knowledge about contraceptive methods is related to actual use and how fertility intentions match actual behavior (Morgan 2001; Oni and McCarthy 1991; Schoen et al. 1999; Wong and Tang 2001). This paper turns to some of the other attitudinal

areas identified by these frameworks, combines this framework with the economic framework described above, and looks at how attitudes that may reflect the costs and benefits of childbearing and contraceptive use quite broadly (i.e. the psychic costs of contraceptive use or the motivations for fertility limitation) are related to an individuals' fertility limitation (i.e. actual contraceptive use behavior). Because economic theories have played a larger role in the demographic literature I use that language throughout this paper.

I incorporate theories of social change to help identify relevant attitudes in this particular setting. These theories posit that certain contextual changes can lead individuals to become less connected to their families and for daily life to become more connected to non-family institutions (Thornton and Fricke 1987; Thornton and Lin 1994). This results in individuals becoming increasingly individualistic, more concerned with Western ideals of money and consumer goods, more secular, and more emotionally nucleated (i.e. their attitudes change) (Caldwell 1982; Lesthaghae and Surkyn 1988; Thornton and Fricke 1987; and Thornton and Lin 1994). These new attitudes may alter any cost-benefit assessment related to fertility limitation. For instance, individuals' relative preferences for children versus other goods will influence their assessment of the perceived costs and benefits of having (or not having) children. According to these frameworks of social change, attitudes about children that reflect consumption, individualism, and religion may be particularly relevant to fertility limitation in a setting where the organization of life is shifting away from the family (Caldwell 1982, Lesthaghae and Surkyn 1988, Thornton and Fricke 1987, and Thornton and Lin 1994).

Setting

The specific setting in question is important because it, in part, determines which attitudes may influence fertility limitation behavior. This study takes place in Chitwan, Nepal. Until the 1950s, Chitwan was covered with virgin jungle and thinly inhabited by indigenous ethnic groups (Guneratne 1994). In the 1950s, the government began clearing parts of the jungle, implemented malaria eradication efforts, and instituted a resettlement plan leading to the migration of many different ethnic groups down from the hill and mountain regions. By the late 1970s, roughly two-thirds of the valley was cultivated and the first all-weather road was completed linking Narayanghat (the main town in one corner of the study area) to India and eastern Nepalese cities. Following that, two other roads were built—one to the west and one north to the capital city, Kathmandu. Because of Narayanghat's central location, it quickly became the transportation hub for the entire country.

Virtually all residents are subsistence farmers, although there are a handful of larger endeavors such as chicken farms and some small shops and services. Farming in this area, especially transplanting and harvesting rice, is labor-intensive work and often extended families and groups of women will work the fields together in succession.

Fertility has been quite high in Nepal, only recently beginning to decrease, as contraceptive use to limit childbearing has become more widespread. The Total Fertility Rate dropped from over 6 in the 1960s to approximately 2.95 by 2010 (Suwal 2001; Tuladhar 1989; United Nations 2011). First births rapidly follow marriage; the average first birth interval is 18 months (Ghimire 2002), and contraception to limit fertility has been virtually non-existent until the very recent past (Banister & Thapa 1981; Tuladhar 1989). The observed reduction in childbearing was mainly a result of births averted through sterilization, which continues to be a prominent method of contraception in Nepal (Ghimire 2002; Suwal 2001; Tuladhar 1989). Desired family size remains high with virtually everyone preferring to have two or more children, and the majority at least three. So, in spite of recent increases in contraceptive use, fertility in Nepal continues to be relatively high and the timing of contraceptive use is the main contributor to differences in completed family size (as opposed

to settings where the timing of the first birth or marriage are more important for completed family size).

Attitudes about children

Although many attitudes related to children are likely to influence fertility behavior, I focus on several that are specific to the Nepalese context of recent, dramatic social change and a largely Hindu, or “Hinduized” population.¹ The theoretical framework employed here predicts that when children are valued more, and in particular valued over non-family activities and items, individuals are less likely to limit their fertility. At the most basic level, and most directly connected to previous research on the role of fertility intentions, we can assess the benefits of children through preferences for large families. When large families are desired or viewed positively, the psychic costs of limiting fertility are greater.

Additionally, the theoretical frameworks employed here and previous research in this setting have demonstrated that social change has led to increased individualism and increased exposure to and participation in market economies (Barber 2001; Caldwell 1982; Freedman 1979; Lesthaghae and Surkyn 1988; Thornton and Lin 1994). If couples are more individualistic or have higher consumption aspirations they may prefer money or consumer goods to children, have more motivation to limit their fertility, and therefore choose to do so.

Because this setting is still undergoing shifts in social organization we may still see that children are valued for religious reasons (Hayford and Morgan 2008; Pearce 2002). Despite the dramatic changes in context described above, religion is an important aspect of Nepalese life and is relevant to fertility limitation. The vast majority of Nepalese report they are Hindu (80%) and the next most common religion is Buddhism (11%) (CBS 2001). Hinduism is generally pro-natalist— if a Hindu does not follow the path of asceticism and deny all worldly possessions and relationships, he/she is required to have children to obtain mukti (ultimate enlightenment) and release from samsara (the cycle of worldly life) (Bennet 1983; Gray 1995). Individuals who ascribe to these religious beliefs will value children more than their more secular counterparts.

Other religious groups are not as specifically pro-natalist as Hinduism, but all have become Hinduized to some extent (Guneratne 2002; Gurung 1988). For example, virtually all Terai Tibeto-Burmese families now use Brahmin priests to conduct Hindu marriage, child naming, and death ceremonies. In reality, the Hindu/non-Hindu distinction is not the most meaningful in Nepal. Instead, group distinctions based on a combined religio-ethnic identity more appropriately capture adherence to religious ideology (Pearce 2002).

Attitudes about contraception

Of course, attitudes about children are not the only thing that will influence fertility limitation behavior—those about contraception are also influential. When individuals disapprove of contraception they attach higher costs to using it and are therefore less likely to limit their fertility. Substantial research efforts have documented the relationship between contraceptive use and knowledge about and attitudes towards specific contraceptive methods (e.g. Klitsch 2002; Maharaj and Cleland 2005; Odimeqwu 1999; Oni and McCarthy 1991), but other more general attitudes about contraception may also be important. For instance, following from the theoretical framework described above, individuals’ assessment of the relative costs and benefits of fertility limitation may be influenced by their perceptions of

¹Hinduization is the process whereby non-Hindu groups are encouraged to incorporate Hindu beliefs and practices to achieve assimilation into larger society (Guneratne 1994, 1998, 2002).

religious and social norms regarding contraception and children. The strong pro-natalism in Hinduism may be interpreted as disapproval of using contraception to limit or control fertility. Women who abide by those religious beliefs are then less likely to go against the religious doctrine and limit their fertility. Their assessment of the costs of controlling their fertility includes any social or psychological costs arising from rebuking these doctrines, tipping the decision-making towards not limiting.² In contrast, family planning programs that encourage contraceptive use may have the opposite effect. In Nepal, billboards and posters promoting the benefits of small families and the use of contraceptive methods are clearly visible along roadsides and in market areas. Women exposed to these campaigns are likely to interpret social norms to be pro-contraceptive use, lowering their costs and increasing the likelihood of limiting their fertility.

Non attitudinal factors

Although attitudes play a key role in demographic theories of fertility, they are not the only important factor. Of particular concern here are factors that would influence the financial costs of childbearing and contraceptive use. Access, both physical and in terms of knowledge, to contraceptive methods is one such important factor. If individuals know where to obtain contraception or live closer to those clinics or health providers then the financial costs associated with fertility limitation would be lower. This would result in increased limitation, regardless of attitudes towards children. Consequently, it will be important to account for this issue in the analysis.

Attitude formation

Studying the effect of attitudes on behavior can be problematic for several reasons. First, unlike experiences such as visiting a health service provider, attitudes cannot be pinned to one concrete point in time. This means that establishing the proper temporal order between attitudes and behavior cannot be accomplished with data from one time period. Longitudinal data collection is needed to ensure that the measured attitudes were in fact formed before the behavior in question. Second, and related to the first, it is difficult to establish proper temporal ordering among attitudes and other important factors. Attitudes are formed over time, and likely begin their formation during childhood. Consequently, including measures that are known to influence fertility behaviors, such as education and work experience, in models with attitudes is difficult if you cannot be sure that those experiences came before the attitudes were formed (and not that the attitudes influenced those experiences). The data used here provide me with the opportunity to address these concerns more directly than is commonly available. These data measure behavior over a ten year period beginning after the attitudes were measured bolstering the argument that the behavior did not form the attitude. Also, the data include detailed measures of the respondent's experiences enabling creation of measures of those experiences throughout the life course. Although I am still not able to determine precisely when a given attitude was formed, I am able to explore how the models change when experiences at various points in the life course are included and assess the independent effects of the attitude measures from those experiences. In the end though, the temporal order and depth of the data can only take us so far. Because of these empirical challenges, although the theoretical framework is causal, empirically I am still only able to ascertain correlation, not causal direction.

²This theoretical link is also relevant to an analysis of contraceptive use for multiple reasons (i.e. to space children or regulate menstruation), not just to limit childbearing. However, because the major shift in demographic behavior of interest in this setting is the ending of childbearing I continue to frame the discussion in terms of limiting childbearing, not merely controlling.

DATA AND METHODS

Data

To empirically test my predictions, I use data from the Chitwan Valley Family Study (CVFS) conducted in Chitwan Valley in south-central Nepal. The study area for the CVFS is a triangular section of Western Chitwan, about 17km long, bounded by jungle, one of the largest rivers in Nepal, and the major highway running from India and Kathmandu. Homes are clustered in neighborhoods at crossroads made up of groups of 5 to 15 households, with farmland covering the several kilometers in all directions between neighborhoods. Shops, schools, and services are also located at these crossroads.

The CVFS combines survey and ethnographic methods to obtain detailed measures of multiple dimensions of individuals' lives. In 1996, it collected information from residents of a systematic sample of 151 neighborhoods in Chitwan Valley—Life History Calendars and survey interviews were obtained for every resident between the ages of 15 and 59 in the sampled neighborhoods and their spouses (Axinn, Pearce, and Ghimire 1999). The survey interview covered a wide array of topics including respondents' attitudes regarding contraceptive use, family size, and children and information on parental and childhood background. All interviews were conducted in the most common language in Nepal, Nepali, and are presented below in translation.

Following the 1996 individual interviews, the CVFS began collecting monthly panel data on contraceptive use for all the individuals in the selected households yielding 4,632 individuals, ages 13–80. Interviewers visit each household monthly and every household member over age 18 is interviewed separately about his/her contraceptive use.³ Households that move out of the study area are tracked and interviewed—95 percent of respondents have now been interviewed for 126 months.

Analysis sample—I analyze data from 943 women in the CVFS who were between the ages of 15 and 44 in 1996, married at some point in the data collection period, and had not used a contraceptive method before the 1996 interview.⁴ I restrict the sample to these younger, non-sterilized women because women beyond childbearing age or who have been surgically sterilized are not at risk for using contraception to avoid pregnancy. Although sexually transmitted diseases and infections are becoming more prevalent in Nepal, and condom use to prevent their transmission is of obvious social importance, the research presented here is concerned with fertility limitation, so I only examine women at risk of pregnancy. I consider women to be at risk of using a contraceptive method only after they are married because, in this setting, premarital sex is extremely rare.⁵

Measures

Fertility limitation—To examine fertility limitation I focus on the timing of first contraceptive use to limit childbearing. Table 1 shows descriptive statistics of women's patterns of contraceptive use in this setting. Sixty-three percent of women in this sample

³During the first interview upon turning 18, respondents were asked to report their contraceptive use for each month between ages 15 and 18.

⁴80 women were excluded due to missing data on one or more of the measures described below. Limiting the sample to women who had no previous contraceptive use left censors the data, but this does not influence the substantive findings presented below. Analyses using a sample of women under 20 in 1996, for whom there is virtually no previous contraceptive use, are similar to those presented here. Also, using a sample that includes women with previous contraceptive use I found that interaction terms between the respondent's attitudes and previous contraceptive use were not statistically significant, implying that the effect of the attitudes does not depend on previous use and that left censoring does not possess a serious threat to my conclusions.

⁵Because I use event history methods to model contraceptive use I am able to include women who were not married at 1996, but marry during the prospective data collection period.

used a contraceptive method at some point during the prospective data collection period. Women in this setting use a variety of methods to limit childbearing, however like other South-Asian populations, Nepalese women (or couples) generally prefer longer-term methods such as sterilization and Depo-Provera (Axinn 1992). Table 1 shows this for the women in the analysis sample. Sixty-seven percent of women who used a method chose sterilization (either for themselves or their husbands), Depo-Provera, an IUD, or Norplant as their first method (Panel A, column C). Additionally, women who initially use another method, such as pills or condoms, use these methods to limit, not to space, childbearing and typically go on to use one of the longer-term or permanent methods. Over forty-five percent of women who used pills or condoms as their first method went on to use a more permanent method (Panel A, column F). These percents would likely be larger if we extended the data analysis period. In all, eighty-two percent of the women who used a contraceptive method in the prospective data eventually used a longer-term method (Panel B, column C). As a result, in this paper I focus on the first use of any contraceptive method as the measure of contraceptive use to limit childbearing.

I investigate the transition from not using contraception to using any contraceptive method and consider eight possible methods—own sterilization, spouse's sterilization, Depo-Provera, IUDs, Norplant, oral contraceptive pills (pills), condoms, or foam—in creating this measure.⁶ I code a time-varying, dichotomous variable equal to 1 the month the respondent first uses any of these contraceptive methods and 0 in months prior. This dependent variable is analyzed in a hazard model framework (described in detail below) and describes behavior captured during the prospective data collection period, 1997–2008.

Including spouse's sterilization in the dependent variable points out an important feature of these analyses—although I talk about the analyses and findings in terms of the wife's attitudes and behaviors, it is essentially a model of couple level behavior predicted by one partner's (the wife's) attitudes and controlling for that partner's experiences. I do not have attitude and experience information for husbands, so I cannot estimate models with both members' characteristics.⁷

Attitudes—The measures of attitudes used here are the result of several years of fieldwork focused on constructing measures of attitudes specific to the rural Nepalese context. Five pilot studies, ethnographies, and cognitive interviews were used to develop Nepalese language measures of attitudes, some of which are often measured in US studies of family attitudes and some of which are designed to be completely specific to the Nepalese context. What I present here are English language translations of the items actually used in Nepal. The original Nepalese question wordings and response alternatives can be found at perl.psc.isr.umich.edu.

Attitudes about children: I investigate three measures that capture attitudes about children that may be relevant for fertility limitation in this setting. The first measure is one specific to the Nepalese context and attempts to capture the respondent's general orientation toward large families. Respondents were asked: “A man who has ten children is a fool. Would you say you strongly agree, agree, disagree, or strongly disagree?” There was very little variation in the responses to this measure with almost three-quarters of respondents saying they strongly agree. As a result, I recode the variable into a dichotomous measure for whether the respondent strongly agreed or not. Descriptive statistics for this and all the attitude measures

⁶This variable also codes a woman who reported using an “other” contraceptive method as using. This is different from reporting abstinence which is reported separately and not included in this dependent variable.

⁷I estimated models excluding husband's sterilization and found substantively similar results to those shown here.

are in Table 2. Individuals who strongly agree with this statement will see fewer benefits to continued childbearing and therefore be more likely to limit their fertility.

The second measure attempts to capture the respondent's attitude regarding the relative importance of children versus money and touches on the role of increasing Westernization and the shift to the market economy. Respondents were asked "It is better to have many children than to be rich. Do you strongly agree, agree, disagree, or strongly disagree with this statement?" This variable is coded 1, strongly agree, to 4, strongly disagree, such that a higher value would be associated with a greater preference for money and desire to limit family size. The mean value was 2.67 revealing that most women felt that money was more important than a large family.

The third measure attempts to capture the respondent's religiously motivated desire for children and again is specific to the Hinduized nature of Nepal. Respondents were asked: "Men who do not have children cannot go to heaven. Do you strongly agree, agree, disagree, or strongly disagree?" This variable is coded similarly to the second measure with 1 as strongly agree and 4 as strongly disagree, such that a higher value would be associated with a less religious need for children and a greater desire to limit family size. The mean was 2.68.

Correlations across these three variables are low. The highest Pearson Correlation Coefficient was .20 for the second and third measures—the relative value of children versus money and the religious importance of children. Although the correlation coefficient is low, their distributions were similar with over two thirds reporting that they disagree with both statements.

Attitudes about contraception: I create two measures to capture general attitudes about contraception and contraceptive use. The first measure captures religiously motivated opposition to contraception. Respondents were asked "Do you believe it is sinful to use contraception?" I coded this variable 1 if the respondent said it was sinful and zero if they reported it was not. Twelve percent of respondents said they believe it is sinful to use contraception. I predict that women who believe it is sinful to use contraception will use contraception to limit childbearing later than women who do not believe it is sinful.

The second measure of attitudes about contraception captures a broader, non-religious support for contraceptive use. Respondents were asked whether they strongly agree, agree, disagree, or strongly disagree with the statement "Everyone should use contraception or family planning." This variable is coded 1, strongly disagree, to 4, strongly agree, such that a higher value would be associated with a greater support of contraceptive use. The mean for this measure is 3.31 meaning the vast majority of respondents agreed that everyone should use contraception. I predict that women who believe that everyone should use contraception will have higher rates of contraceptive use to limit childbearing.⁸

Controls—Attitudes and behavior may be influenced by similar aspects of an individual's history and her community. To help ensure that the results presented below are not spurious associations I control for a host of individual and community level characteristics.

Substantial bodies of literature provide evidence that access to health services, education, work, living experiences, media exposure, and participation in groups influence family

⁸I also tested models that include measures of the respondent's attitudes towards specific contraceptive methods. Respondents were asked whether each method was accessible, effective in preventing pregnancy, or had unpleasant side effects. I explored a range of measures including individual measures and indexes of accessibility, effectiveness, and side effects. There were some significant effects, but including these measures did not change the substantive effects shown in the tables and I exclude them here for parsimony.

related behaviors and attitudes (Axinn and Yabiku 2001; Barber 2004; Barber et al. 2002; Caldwell 1982; Lloyd, Kaufman, and Hewett 2000; Thornton, Alwin, and Camburn 1983). As a result, I control for both an individual's experiences with and exposure to various aspects of community context. First, I created an index measure of the respondent's childhood experiences. For the index I create a series of nine dichotomous variables equal to one if the respondent had visited a health service provider, gone to school, worked for pay outside the home, lived away from her family, seen a movie, listened to the radio, watched television, or participated in a club or group⁹ before the age of 12 and zero otherwise. Because attitude formation likely begins early in the life course, I control for these experiences and exposures during childhood, specifically before the respondent was 12 years old. Age twelve is a desirable cut off because it allows the respondent to have had time to experience certain events (like visit a clinic), is late enough in the life course that respondents actually remember what they have done, and is still early enough in the life course that attitudes about children and contraception were not fully formed.¹⁰ Following previous research, I then summed these nine variables to create an index of the number of individual's non-family experiences (Axinn and Yabiku 2001; Brauner-Otto, Axinn, and Ghimire 2007). In Table 3 I present basic descriptive statistics for all the control measures. The mean number of non-family experiences women in this sample had by age 12 was 2.69, or just under three experiences. Some of these experiences such as working for pay, living outside the home, and participating in a youth club or group are quite rare (as we would expect given the period in the life course) and no one had experienced all nine activities. Creating an index allows me to include all these experiences in the model without creating estimation problems due to small sample sizes.

The second measure refers to the community the respondent lived in before age 12. During the individual interviews respondents were asked numerous questions about the community they lived in before age 12. I use information from these questions to create the measures of childhood community characteristics. Following previous research, I create five dichotomous variables equal to one if the respondent had a health service provider, school, employer, market, or bus stop within an hour's walk of her neighborhood before she was 12 years old and zero otherwise. I then sum these dichotomous measures to create an index of community characteristics during childhood (Axinn and Yabiku 2001; Brauner-Otto et al. 2007). Like the measures of individual experiences before age 12, some of these community characteristics have little variation and combining them into an index measure allows for a simpler more easily estimated model. The mean number of organizations within an hour's walk of their community before age 12 for the women in this sample was just under 4.

Later life community context, such as access to health service providers at the time of contraceptive use, are very likely related to actual contraceptive use behavior (Brauner-Otto et al. 2007; Entwisle et al. 1996). However, I do not include measures of later life experiences or community context because their occurrence is likely due at least partly to one's attitudes about children and contraception—if you think contraception is acceptable you may be more likely to seek out health services. The childhood measures used here are more likely to be exogenous to fertility behavior and the analyses in this paper reveal total effects.

I include measures of the respondent's childbearing history before the prospective data collection. Since contraceptive use in Nepal is largely to end childbearing, most women do

⁹Groups refers to community based groups focusing on issues including women's issues, seed dispersion, micro-loans, and social groups.

¹⁰I present measures referring to age 12 in the paper because the data include specific questions about the respondent's neighborhood at that time. However, since this is a relatively arbitrary cut off I tested measures of the respondent's experiences at age 10 and age 15 and found virtually the same findings as those presented here.

not use contraception until after they have had their desired number of children. As a result I created a count measure of the number of children the respondent reported giving birth to. This is a timevarying measure. Of course, it is likely that this variable is endogenous and I test the sensitivity of my results to including it in the models.

Previous research has found that parental characteristics are important predictors of both attitudes and behavior (Axinn and Thornton 1992, 1993; Axinn and Yabiku 2001; Barber 2000, 2001; Barber and Axinn 1998; Thornton and Camburn 1987). Consequently, I use dichotomous measures to control for father's and mother's education (ever went to school), father's employment (ever had non-family employment before respondent's age 12), and parents ever used contraception. I also include a count measure of the respondent's mother's children ever born.

Additionally, the above discussion reveals that religion may have a strong relationship with both women's attitudes and their fertility limitation behavior (Acharya and Bennett 1981; Bista 1972; Fricke 1986; and Gurung 1980). Because religion is very tightly connected to ethnicity I create measures to account for the respondent's religio-ethnic group. I use dichotomous variables to control for five classifications of religio-ethnicity: high-caste Hindu, low-caste Hindu, Newar, hill Tibeto-Burmese, and terai Tibeto-Burmese. High-caste Hindu is the reference group in the analyses.¹¹

Finally, I also control for birth cohort. I create dichotomous variables for four birth cohorts: 1981–1977 (ages 15–19 at the 1996 survey), 1976–1972 (ages 20–24 at the survey), 1971–1967 (ages 25–29 at the survey), and 1966–1952 (ages 30–44 at the survey). The 1981–77 birth cohort is the reference group for all the analyses.

Analytic Strategy

I treat fertility limitation as a transition occurring over time and use discrete-time event history, or hazard modeling, techniques to estimate all of these models (Allison 1982, 1984; Barber et al. 2000; Petersen 1986, 1991). Person-months of exposure are the unit of analysis, and I consider women to be at risk after they marry for the first time. For women who marry before February 1997, the start of the prospective data collection, I start the hazard in this first month of the prospective data collection. Otherwise, I start the hazard the month after the respondent marries.¹² Person months when a woman is not at risk of contraceptive use because of pregnancy or a change in marital status are excluded from the estimation. To control for the baseline hazard I include two time-varying terms—a count measure equal to the time, in months, contributed to the hazard and a quadratic variable of that time.¹³

Because the outcome in question has only one destination state and is measured as a dichotomous variable, logistic regression is an appropriate estimation technique (Allison 1982; Guilkey and Rindfuss 1987).

¹¹I also explored measures of the respondent's religiosity. The importance of religion and the frequency the respondent prays at home were not statistically related to the hazard of fertility limitation. They are excluded here for parsimony.

¹²Because individual interviews were conducted between June and December of 1996 and the prospective data collection began for everyone in February 1997, the first "month" of the prospective data collection may have occurred as many as 7 months and as little as 2 months after the attitudes were measured. At the February 1997 interview respondents were asked about their contraceptive use between the date of their individual interview and February 1997. As a result, this first "month" refers to different time frames for different respondents. I include a control equal to one for the person months that correspond with this first period in the data collection. This control is included in all the models presented in this paper.

¹³Creating multiple person-months of data for each person to use in discrete-time hazard models is not equivalent to inflating the sample size. That is, this approach does not artificially deflate standard errors (Allison 1982, 1984; Petersen 1986, 1991). The estimated standard errors are consistent estimators of the true standard errors (Allison 1982: 82).

Neighborhoods in the CVFS were sampled using a multi-stage probability proportionate to size sampling strategy and all individuals aged 15–44 in sampled neighborhoods and their spouses were then interviewed (see Barber et al. 1997 for complete details). As a result, women in the sample are clustered with several living in the same community. I use survey adjustments in STATA to estimate discrete-time hazard models with robust standard errors. I tested the sensitivity of my results to this approach by estimating uncorrected models, hierarchical models with random neighborhood level intercepts, and multilevel models with neighborhood level fixed effects and found my results consistent across modeling specifications.

RESULTS

Attitudes about children

Table 4 presents the results for the models of attitudes about children and fertility limitation (odds ratios with z-statistics in parentheses are shown). In column 1 we see that women who strongly agree that a man who has ten children is a fool have a higher rate of contraceptive use than women who do not.¹⁴ Specifically, the odds ratio of 1.25 means that a woman who strongly agreed with the statement had a rate of contraceptive use 25 percent higher than women who strongly disagree, disagree, or agree with the statement.

Looking at the control measures we see that few of the controls were statistically significant. Women who had more children limited their fertility earlier than women who did not. Excluding this time varying measure of number of children, a potentially endogenous variable, from the models resulted in virtually identical results to those presented here. Hill Tibeto-Burmese women limited their fertility earlier and Terai Tibeto-Burmese women later than high caste Hindu women. Also, older women had lower rates of contraceptive use than the younger women—which is not surprising given the secular trend of increasing use of contraception over time and that these models control for the number of children born. Although the index measures themselves are not statistically significant, in other models not shown here I estimated the effect of each experience or aspect of the community separately and found that media exposure before age 12 was statistically significant. The salience of media is in line with previous research in this area (Barber and Axinn 2004).

In columns 2 and 3 we see that the other two measures of attitudes about children were also positively and significantly related to the hazard of contraceptive use. Women who felt money is more important than children and that children are not religiously necessary had higher rates of contraceptive use (recall, these measure are coded such that a larger number denotes stronger disagreement). Because the effects are multiplicative, a woman who strongly disagreed with the statement that it is better to have many children than to be rich had a rate of contraceptive use 94 percent higher than a woman who strongly agreed with the statement ($1.94=1.18^4$). In Model 4 I include all three attitude measures to assess whether they all have independent effects on fertility limitation. Two of the measures maintain their statistical significance. This appears to be due to the combination of all three measures. A man who has ten children is a fool is significant in models with either of the other two measures—it is only when you add in the all three that it becomes insignificant.

Attitudes about contraception

Table 5 looks at the measures of attitudes about contraception. All the control variables shown in Table 4 are included in these models—they are excluded for parsimony. In Model

¹⁴Because my theoretical framework leads to directional hypotheses (e.g. women who disagree that it is better to have many children than to be rich will have *higher* contraceptive use rates) I employ one-tailed statistical significance tests.

1 we see the more religious based attitude about contraception is not statistically related to the hazard of contraceptive use, but that a more general measure of whether everyone should use contraception was. Women who agreed with the statement that everyone should use contraception had fertility limitation rates 13 percent higher than women who disagreed with the statement (results are the same when the variables are included in models separately). These findings provide some support for attitude-behavior consistency theory—women with pro-contraception attitudes have higher rates of actual contraceptive use.

In Models 2–5 we see that two of the measures of attitudes about children remain essentially unchanged when we add in measures of attitudes about contraception (compare to Table 4, Models 1–4). That is, attitudes about children and contraception maintain their independent effects and the size of their effects remain quite similar when they are included in the same model. This is as expected based on the theoretical framework where costs and benefits of contraception and children are *all* predicted to influence fertility behavior.

Of course, these measures are only three of the myriad potential measures for each attitude and for other attitudes about children. With additional measures we may very well find more independent relationships.

In other analyses not shown here, these attitudes about family were also found to have strong effects on fertility limitation independent of women's attitudes regarding the effectiveness, accessibility, and potential side effects of specific contraceptive methods.

DISCUSSION

This paper relies on multiple theoretical frameworks for understanding the attitude-behavior link and provides evidence that attitudes from multiple domains are independently and simultaneously related to fertility behaviors. The analyses presented here provide strong evidence that attitudes from multiple domains are simultaneously related to one specific behavior. Empirically we can only assess correlation, but theory implies that attitudes about multiple factors that may influence the costs and benefits of fertility limitation matter in terms of the decision to limit fertility. The valuation of benefits may come from various considerations, such as whether it is better to have many children or more money or religious beliefs. Additionally, the specific empirical findings presented in this paper have important implications for researchers studying numerous other individual behaviors as well.

Demographic theories often, explicitly or implicitly, rely on attitudes as a key mechanism through which macro level changes influence micro level behaviors (Cleland and Wilson 1987; Freedman 1979; Lesthaeghe and Surkyn 1988; Thornton and Lin 1994). Combining social-psychological theories of behavior with economic models of fertility and frameworks of social change yields a solid framework for investigating how specific attitudes about children are related to fertility behaviors. This merging of theoretical frameworks from multiple disciplines guides the researcher to take a broad approach to studying behavior and look widely to determine what factors influence each behavior.

The findings presented here provide empirical evidence that the psychic costs of childbearing and contraception are related to fertility. At least partly because of the data requirements necessary, little research has looked at how these broader attitudes are related to actual fertility behaviors (as opposed to research on fertility intentions and childbearing or contraception knowledge attitudes and contraceptive use). I use a unique data source where multiple measures of attitudes towards children and contraception were measured long before the behavior was observed and document the independent relationship between psychic costs and fertility limitation.

I found that multiple measures of women's attitudes about children and contraception were all related to their subsequent actual use of contraception to limit childbearing. Furthermore, measures of women's attitudes about children had strong estimated effects independent of attitudes about contraception. Together these findings indicate that a variety of attitudes play an integral and complicated role in women's fertility limitation decision-making. So, although much research on contraceptive use has focused on increasing knowledge, awareness, and acceptance of contraception, these results imply that similar behavioral changes may result from changes in other attitudes as well. This has important implications for policy makers and program designers—even policies and programs not about contraception may have real consequences for family life.

That measures of attitudes about children that reflect different social areas maintain independent effects when included in the same model, and that the effects are essentially the same to those when estimated separately, allows us to see the nuances in the attitudes they may be capturing. The first consistently significant measure specifically asks the respondent to think about children in terms of economics whereas the second one refers to religious motivations for childbearing. Both of these areas are identified as important in the existing social-psychological frameworks (e.g. Ajzen and Fishbein 1980; Miller and Pasta 1995) and here we find empirical evidence of their independent relationship with fertility behavior. In Nepal, where dramatic social change is happening and religio-ethnic identity still plays an important role it is not surprising that we see these parallel effects—by dramatic social change I am referring to changes such as the rise in school enrollment for girls from about 10 percent in 1954 to 50 percent in 1995 (Beutel and Axinn 2002). Women are likely hearing conflicting messages—their teachers or the textbooks they encounter may stress the importance of wealth and investing in financial endeavors, but religious leaders and elder family members may stress religious obligations regarding childbearing. They may have responded to these two questions based on two separate underlying attitudes—one based on religion and one based on community obligation. That is, both one's religious beliefs about children and their ideas about the market economy and wealth influence their decisions regarding childbearing. Although perhaps not a surprising finding, documenting this effect in a non-Western setting is a significant contribution to the literature.

These findings constitute evidence that decisions about contraceptive use, childbearing, and family are complex and incorporate multiple domains—evidence that may be particularly useful information for researchers studying sexual behavior in other settings. For example, U.S. adolescents' sexual behavior is complicated and often involves different perceptions of the relative costs and benefits of childbearing and contraceptive use than for older couples (Luker 1996). Researchers interested in investigating adolescent sexual behavior in the U.S. may want to collect data on how adolescents perceive these relative costs and benefits and the full range of attitudes that influence this perception and valuation. These alternative pathways for investigation may provide valuable new information useful in designing programs and policies that lower sexual risk taking—a primary concern of researchers working in this area.

The attitudes I investigate here about children and contraception are important not just for what they tell us about individual level decision-making processes, but also for what they reveal about the process through which social change occurs. Substantively, as a group, the attitudes about children presented in this paper attempt to capture the respondent's attitudes toward new ideas. Historically in Nepal, women were much more likely to agree with these measures of attitudes about family—women born in more recent cohorts are more likely to hold the attitudes that correspond with higher rates of contraceptive use (analyses of these data not presented here). That is, in this setting, these attitudes are more common among younger women and as such represents new or innovative attitudes that correspond with

engaging in innovative behavior, specifically using contraception to limit childbearing. Furthermore, this relationship between holding innovative attitudes and later adopting an innovative behavior is independent of perceptions of access to contraception and other similar attitudes that are commonly cited as influencing contraceptive use and independent of other individual and community characteristics that could create or influence the attitudes. These analyses are evidence that this dramatic adoption of an innovative behavior was preceded by dramatic changes in attitudes.

The changing social context may also at least partly explain why I did not find statistically significant effects for the measures of childhood experiences and community factors. Theory predicts that these would influence both the attitudes in question and family formation behaviors and previous research in this setting did find important statistically significant relationships (e.g. Axinn and Yabiku 2001, Axinn and Barber 2004; Barber 2004; Yabiku 2004, 2005). However, this previous work was looking at contraceptive and marriage behavior occurring before 1996, where as this paper looks at behavior after 1996. Given the dramatic social change that as occurred over the past 50 years, it is not surprising that the particular aspects of childhood and community that are influencing behavior has changed. In fact, other research using the CVFS data over the same time period as this paper has found that measures of simple proximity to specific community organizations may not fully capture the community context effect (Brauner-Otto 2012; Brauner-Otto et al. 2007). Future research should look more explicitly at the cohort differences in the relationship between childhood experiences and community and family formation behavior to shed light on the new, influential components so social change.

In closing I make one final note about causality. As with any social science research, it is possible the effects observed here are actually due to some omitted variable. I have attempted to address this by including multiple control measures of those factors, such as parental background, which theory says may influence both attitudes and behavior, especially as they relate to fertility. Of course, it is possible these controls are not sufficient. However, since it is not possible to randomly assign attitudes to individuals, proposing a randomized experiment as a potential solution is not feasible. One approach to address this potential problem for future projects is to collect data on individual's attitudes at multiple points across the life course. Having multiple measures, especially measures early in the life course, would allow the researcher to test hypotheses regarding the timing of attitude formation and specifically when the attitudes that ultimately influence behavior are formed. This information can in turn help researchers and policy makers better understand the processes of attitudinal and behavioral change and continue the development and improvement of theoretical attitude-behavior models.

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Contraceptive Use Patterns Among Women Aged 15–44 in 1996 With No Prior Contraceptive Use, Chitwan Valley Family Study, Chitwan, Nepal.

Table 1

		% who first used specific method and later used:					
		% of all women in sample (N=943)		% of women who ever used (N=552)			
		N	B	C	D	E	F
Panel A. First method used							
Any method [*]		552	58.54	100.00	--	--	--
Any longer-term method		367	38.92	66.49			
Sterilization		126	13.36	22.83	--	--	--
Depo-Provera/IUD/Norplant ^a		241	25.56	43.66	22.82	--	--
Pills		84	8.91	15.22	23.81	33.33	46.43
Condoms		79	8.38	14.31	24.05	30.38	46.84
Foam/other ^b		22	2.33	3.99	18.18	22.73	40.91
Panel B. Ever used							
Any method [*]		552	58.54	100.00			
Any permanent method		453	55.57	82.07			
Sterilization		224	23.75	40.58			
Depo-Provera/IUD/Norplant		300	31.81	54.35			

^{*} Dependent variable in analyses.

^a 5 women reported using an IUD as their first method, 1 reported using Norplant

^b No additional information was provided when 'Other' was listed, but 'Abstinence' was a separate category that is not included in the dependent variable here. All results hold if the 'Other' responses are excluded from the dependent variable.

Table 2

Descriptive statistics, measures of attitudes among 943 women aged 15–44 in 1996 with no previous contraceptive use. CVFS, Chitwan, Nepal.

	Mean	SD	Min	Max
Children				
Strongly agree that a man who has ten children is a fool.	0.72		0	1
It is better to have many children than to be rich.	2.67	0.70	1	4
Men who do not have any children cannot go to heaven.	2.68	0.74	1	4
Contraception				
Do you believe it is sinful to use contraception?	0.12		0	1
Everyone should use contraception/family planning.	3.31	0.78	1	4

Table 3

Descriptive statistics, control measures among 943 women aged 15–44 in 1996 with no previous contraceptive use. CVFS, Chitwan, Nepal.

	Mean	SD	Min	Max
Index of childhood non-family experiences	2.69	1.62	0	7
Index of childhood community characteristics	3.90	1.43	0	5
Number of children born (time varying)	2.47	1.90	0	11
Family background				
Father's education (ever went to school)	0.40		0	1
Father's employment (ever had paid employment)	0.46		0	1
Mother's education (ever went to school)	0.10		0	1
Parental contraceptive use (parents ever used)	0.38		0	1
Mother's children ever born	5.80	2.38	1	19
Ethnicity				
High-caste Hindu (reference group)	0.47		0	1
Low-caste Hindu	0.10		0	1
Newar	0.07		0	1
Hill Tibeto-Burmese	0.15		0	1
Terai Tibeto-Burmese	0.20		0	1
Birth cohort				
Born 1981–1977 (ages 15–19 in 1996) (reference group)	0.37		0	1
Born 1976–1972 (ages 20–24 in 1996)	0.25		0	1
Born 1971–1967 (ages 25–29 in 1996)	0.16		0	1
Born 1966–1952 (ages 30–44 in 1996)	0.22		0	1

Table 4

Hazard Model Estimates: Relationship Between Attitudes About Children and Fertility Limitation, Women aged 15–44 in 1996, Chitwan, Nepal^a

	1	2	3	4
Attitudes about children				
Strongly agree that a man who has ten children is a fool.	1.25 * (1.84)			1.22 (1.63)
It is better to have many children than to be rich.		1.18 * (2.27)		1.15 * (1.96)
Men who do not have any children cannot go to heaven.			1.14 * (2.32)	1.11 * (1.76)
Controls^a				
Index of childhood non-family experiences	1.02 (0.53)	1.02 (0.46)	1.02 (0.55)	1.01 (0.40)
Index of childhood community characteristics	1.03 (0.76)	1.05 (1.23)	1.04 (1.03)	1.04 (0.90)
Number of children born (time varying)	1.42 *** (8.81)	1.42 *** (8.06)	1.41 *** (8.16)	1.43 *** (8.63)
Family background				
Father's education (ever went to school)	0.93 (−0.78)	0.92 (−0.84)	0.93 (−0.82)	0.93 (−0.81)
Father's employment (ever had paid employment)	1.11 (1.09)	1.11 (1.03)	1.11 (1.09)	1.10 (1.02)
Mother's education (ever went to school)	0.94 (−0.35)	0.94 (−0.35)	0.94 (−0.35)	0.92 (−0.48)
Mother's children ever born	0.98 (−0.96)	0.98 (−1.04)	0.98 (−0.92)	0.98 (−1.12)
Parental contraceptive use (parents ever used)	1.06 (0.51)	1.07 (0.60)	1.07 (0.68)	1.05 (0.48)
Ethnicity^b				
Lower-caste Hindu	1.15 (0.83)	1.16 (0.86)	1.17 (0.92)	1.20 (1.08)
Newar	0.99 (−0.07)	0.96 (−0.21)	0.95 (−0.27)	0.97 (−0.19)
Hill Tibeto-Burmese	1.30 * (1.80)	1.28 * (1.70)	1.30 * (1.80)	1.31 * (1.82)
Terai Tibeto-Burmese	0.80 (−1.53)	0.78 * (−1.70)	0.76 * (−1.82)	0.81 (−1.33)
Birth cohort^c				
Born 1976–1972 (age 20–24 in 1996)	0.91 (−0.87)	0.91 (−0.82)	0.91 (−0.88)	0.90 (−0.93)
Born 1971–1967 (age 25–29 in 1996)	0.52 *** (−3.54)	0.53 *** (−3.43)	0.53 *** (−3.39)	0.53 *** (−3.48)
Born 1966–1952 (age 30–44 in 1996)	0.11 *** (−8.00)	0.12 *** (−7.44)	0.12 *** (−7.54)	0.12 *** (−7.81)
Time				
Months since hazard started	0.99 ** (−2.47)	0.99 ** (−2.43)	0.99 ** (−2.44)	0.99 ** (−2.44)
Months since hazard started squared	1.00 (1.03)	1.00 (1.00)	1.00 (1.02)	1.00 (1.03)

N=55,227 person-months;

^aAll models also include intercept term;

^bReference category is Upper caste Hindu;

^cReference group is born 1981–1977 (age 15–19 in 1996);

* P < .05;

** P < .01;

*** P < .001 one tailed tests

Odds ratios with z-statistics in parentheses.

Hazard Model Estimates: Relationship Between Attitudes About Children, Attitudes about Contraception, and Fertility Limitation, Women aged 15–44 in 1996, Chitwan, Nepal^a

Table 5

	1	2	3	4	5
Attitudes about children					
Strongly agree that a man who has ten children is a fool.		1.21 (1.56)			1.18 (1.34)
It is better to have many children than to be rich.			1.19 ** (2.35)		1.17 * (2.05)
Men who do not have any children cannot go to heaven.				1.15 ** (2.40)	1.12 * (1.85)
Attitudes about contraception					
Do you believe it is sinful to use contraception?	0.84 (−0.99)	0.87 (−0.81)	0.84 (−0.96)	0.85 (−0.87)	0.88 (−0.70)
Everyone should use contraception/family planning.	1.13 * (2.10)	1.12 * (1.98)	1.14 * (2.22)	1.14 * (2.27)	1.15 * (2.23)

N=55,227 person-months

^a All models also include all controls described in text.

* P < .05;

** P < .01;

*** P < .001 one tailed tests

Odds ratios with z-statistics in parentheses.